

This manuscript presents a timely and thorough review and evaluation of experimentally determined gas phase diffusion coefficients for reactive inorganic atmospheric trace gases. Accurate diffusion coefficients are required to evaluate the uptake rate of reactive and/or soluble trace gases by cloud/fog droplets, accumulation mode or larger aerosol particles and macroscopic surfaces such as buildings, soil, sea or fresh water and vegetation.

This review accomplishes several useful functions, including: 1) reviewing the most appropriate experimental and computational methods available to measure/estimate gas phase diffusion coefficients; 2) cataloging available experimental data for measurements made at atmospherically relevant temperatures and for relevant bath and trace gases; 3) computing estimated diffusion coefficients for the available measured systems using Fuller's method, the most widely accepted semi-empirical model; 4) evaluating the resulting experimental and computational results to identify and estimate the uncertainty associated with the best available data for use in analyzing experimental heterogeneous kinetics experiments and modeling heterogeneous atmospheric chemistry; and 5) identifying important data gaps to stimulate and guide future measurements.

The manuscript is well referenced, well illustrated and generally well written. I recommend acceptance for publication in ACP.

I did notice some typographical and usage errors and suggest the following copy edits:

- 1) page 15653, line 14 – remove “as” after “called”
- 2) page 15654, line 23 – replace “which we include” with “that we include” or put a comma between “gases” and “which”
- 3) page 15655, line 1 – change “are the molar fraction” to “are the molar fractions”
- 4) page 15655, line 2 – change “is the diffusivity” with “are the diffusivities”
- 5) page 15656, equation (13) – second term on rhs numerator should be $c_i - c_{i-1}$ not $c_i - c_{1-1}$
- 6) page 15658, lines 22, 23 & 24 and page 15667 line 31 – the text on 15658 twice says “De andrede” but the reference on page 15667 says “De Andrede”
- 7) page 15662, line 27 – consider rephrasing “a factor of 1-2 larger” since a factor of 1 is not larger
- 8) page 15679, line 3 of Table 5 footnote –remove extraneous “;” after superscript “h”
- 9) page 15681, last line of Figure 1 caption – change “pressure” to “pressures”